

## CORING ASPHALT PAVEMENT FOR THICKNESS

### 1. SCOPE:

- 1.1. This method provides for thickness determination by the coring of newly constructed asphalt pavement in new construction applications.

NOTE 1: Do not obtain cores for projects involving less than 10,000 square yd. of asphalt pavement. In this case, the Department will accept thickness on the basis of inspection of the application rate and a visual inspection of placement.

- 1.2. Obtain cores for specification compliance after completing all courses of asphalt pavement and necessary leveling. When requested by the Department, core part of the total surfacing area of the project prior to completion of all asphalt pavement work for the project.

#### 1.3. Coring:

~~1.3.1. When requested, the Department's Division of Materials will obtain and measure cores for specification compliance.~~

~~1.3.21. When electing to perform the coring, obtain~~ Obtain the cores at no expense to the Department. Provide both the coring and core-measuring equipment specified in Subsection 2 of this method. Complete the coring in accordance with this method and at locations directed by the Department. The Department will measure the cores; the appropriate District Materials Engineer (DME) will retain a report of the results along with each location.

~~1.3.32.~~ When the recoring of deficient sections after the application of additional material is necessary, perform the coring at no expense to the Department.

- 1.4. The DME will report the core results and calculate the amount of non-specification tonnage (excessive or deficient quantities) using the "Pavement Management Software" computer program developed by the Department for this purpose.

- 1.5. In applying the computer program, the Department will not include excessive or deficient quantities for areas within 200 linear ft. of bridge ends.

### 2. APPARATUS:

- 2.1. Coring equipment: ~~When electing to perform the coring, provide~~ Provide a truck or portable core drill rig with diamond masonry bits capable of obtaining a core with a minimum diameter of  $4 \pm 0.1$  in.

- 2.2. Core measurement: ~~When electing to perform the coring, provide~~ Provide calipers in accordance with Kentucky Method (KM) 64-308, Method of Measuring Length of Drilled Cores.

### 3. CORING:

#### 3.1. Coring frequency:

- 3.1.1. Routine cores: For determining normal specification compliance, obtain one routine core to represent each lot consisting of a 1000-linear-ft. section of mainline pavement (or fraction thereof, providing the fractional section exceeds 500 linear ft.), edge to edge (including truck lanes). When the design depth of the shoulders matches the mainline pavement, obtain a single routine core for each 1000 ft. to represent the entire width of the mainline plus shoulders. When shoulders are in excess of 3 in. thickness and have a different design depth than the mainline pavement, obtain cores separately from the mainline and at the following frequencies for shoulders (or fraction thereof, providing the fractional section exceeds half of the normal distance between shoulder cores):

| <u>Width of Shoulder (ft.)</u> | <u>Distance Between Cores (ft.)</u> |
|--------------------------------|-------------------------------------|
| 2                              | 11,250                              |
| 4                              | 5625                                |
| 6                              | 3750                                |
| 8                              | 2813                                |
| 10                             | 2250                                |

- 3.1.2. Exploratory cores: When a routine core is out of allowable specification tolerances, obtain exploratory cores every 200 ft., backward and forward, until a core within specification tolerance is obtained. Adjust this 200-ft. interval to avoid obtaining any exploratory cores closer than 100 ft. of bridge ends.

#### 3.2. Determining coring locations:

- 3.2.1. If possible, start coring on the section beginning with the smaller station numbers.
- 3.2.2. In the first 1000-ft. section, select at random a coring location (station number). Obtain the second routine core approximately 1000 ft. from the first; the third, 1000 ft. from the second; etc. Adjust the 1000-ft. intervals for routine cores when necessary to avoid obtaining any cores closer than 200 ft. of bridge ends.
- 3.2.3. Bridges or other physical discontinuities that require an adjustment in the 1000-ft. sections may also require the selection of a new beginning coring location. Consider the edge of the mainline to be a physical discontinuity when coring entrances and approach roads.
- 3.2.4. Vary the transverse coring locations for routine cores, but do not obtain cores closer than two feet to the edge of the pavement or curb. Obtain exploratory cores both ahead and behind the out of specification, routine core in the direction of the two adjacent, routine core locations. Determine the transverse location of the exploratory cores by interpolation between the distances from the centerline of the two routine core locations between which the exploratory cores are being taken.
- 3.2.4.1. For example, a routine core (Core A), taken 10 ft. right of the centerline, is out of the allowable specification tolerance. The last routine core within the allowable specification tolerance, Core B, taken 10 ft. left of the centerline, is 1000 ft. behind Core A. Obtain the first exploratory core 200 ft. behind Core A in the direction of

Core B at six feet right of the centerline. Determine this transverse location by taking 20 % (200 linear ft./1000 linear ft.) of the 20-ft. transverse span between Core A and Core B. If necessary, obtain the second exploratory core 400 ft. behind Core A in the direction of Core B at two feet right of the centerline. Determine this transverse location by taking 40 % (400 linear ft./1000 linear ft.) of the 20-ft. transverse span between Core A and Core B. In the same manner, if necessary, obtain the third exploratory core 600 ft. behind Core A in the direction of Core B at two feet left of the centerline. Finally, if necessary, obtain the fourth exploratory core 800 ft. behind Core A in the direction of Core B at six feet left of the centerline.

3.2.4.2. Similarly, obtain exploratory cores ahead of Core A at 200-ft. intervals until obtaining a core within the allowable specification tolerance. Declare a transverse distance from the centerline for a theoretical Core C, located 1000 ft. ahead of Core A. For example, if the theoretical Core C would be taken at 6 ft. left of the centerline, obtain the first exploratory core 200 ft. ahead of Core A in the direction of Core C at 6.8 ft. right of the centerline. Determine this transverse location by taking 20 % (200 linear ft./1000 linear ft.) of the 16-ft. transverse span between Core A and Core C. If necessary, obtain the second exploratory core 400 ft. ahead of Core A in the direction of Core C at 3.6 ft. right of the centerline. Determine this transverse location by taking 40 % (400 linear ft./1000 linear ft.) of the 16-ft. transverse span between Core A and Core C. In the same manner, if necessary, obtain the third exploratory core 600 ft. ahead of Core A in the direction of Core C at 0.4 ft. right of the centerline. Finally, if necessary, obtain the fourth exploratory core 800 ft. ahead of Core A in the direction of Core C at 2.8 ft. left of the centerline.

3.3. Core all mainline pavement, shoulders in excess of 3 in. depth, and ramps. Core entrances and approach roads when greater than 300 ft. in length. Do not core transition zones of variable thickness necessary to match existing grades.

3.4. ~~Measure-~~The Department will measure the cores in accordance with KM 64-308.

#### 4. PROCEDURE FOR DETERMINING NON-SPECIFICATION AREAS:

4.1. Non-specification area: The Department will determine the area of a section that is non-specification in thickness as follows:

4.1.1. Width: The Department will consider the width of the section as the average design width, or other approved width, that the cores represent. Other approved widths s include additional widening where directed by the Department.

4.1.2. Length: The Department will consider the length of the section equal to the sum of: (1) the length represented by either consecutive, deficient-thickness cores or consecutive, excessive-thickness cores; plus (2) a proportionate length on each end between the first (or last) non-specification core and the adjacent, in-specification core. The Department will determine the proportionate, non-specification part on each end by ratio/proportion calculations or by graphing.

NOTE 2: The Department will perform this calculation automatically using the computer program.

4.2. The Department will determine the quantities for non-specification areas as follows:

4.2.1. Excess thickness: When a core measurement is in excess of 0.5 in. of the compacted, plan thickness, the Department will report the quantity in excess of the 0.5-in. tolerance as a non-specification, excess quantity. The Department will determine this quantity by multiplying the calculated, excess volume by the density used as a basis for establishing contract quantities and report the quantity in tons (Note 2).

4.2.2. Deficient thickness: When a core measurement is deficient by more than 0.5 in. from the compacted, plan thickness, the Department will determine the total deficient quantity from the compacted, plan thickness by multiplying the calculated deficient volume, including the 0.5-in. tolerance, by the density used as a basis for establishing contract quantities and report the quantity in tons (Note 2).

5. REPORT: ~~Include~~ The Department will include the following information in each core-thickness report.

5.1. The plan (design) thickness.

5.2. The thickness of all cores, routine and exploratory (when necessary).

5.3. The stations (length), location of the deficient-thickness sections, and quantity (tons) deficient from the design thickness.

5.4. The stations (length), location of the excessive-thickness sections, and quantity (tons) in excess of the design thickness.

APPROVED \_\_\_\_\_

Director  
DIVISION OF MATERIALS

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